**Original Research Article**

**Purchase Procedure and Supplier Evaluation for Food Processing Firms in Gujarat**

## ABSTRACT

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| --- |
| The food processing industry, both globally and in India, is undergoing rapid transformation driven by increasing consumer demand for safe, high-quality, and convenient products. As a major agricultural producer, India plays a pivotal role in the global food supply chain, particularly in the expanding frozen food segment, where demand for ready-to-eat and ready-to-cook products is rising steadily. This study focuses on the procurement and supplier evaluation practices of a leading frozen food manufacturer based in Gujarat. It critically examines the company’s structured procurement framework, which emphasizes transparency, cost optimization, and strict compliance with food safety and regulatory standards. The procurement process involves close coordination among cross-functional departments including production, quality control, and new product development (NPD), ensuring seamless sourcing and consistent product quality. Primary data were collected from 20 procurement professionals across the sector using a structured questionnaire. The Henry Garrett Ranking method was applied to prioritize supplier evaluation criteria based on practical significance. The analysis revealed that product quality was considered the most crucial factor in supplier selection, with a Garrett mean score of 78.40, followed by price (75.00) and accuracy of delivery (70.36). Other notable criteria included rejection handling, supplier capability, and service responsiveness. The findings provide a practical and data-driven framework that can be adopted by food processing firms to enhance supplier selection, streamline procurement workflows, and strengthen supply chain resilience. The study also contributes to existing literature by bridging the gap between procurement theory and its real-world application in the Indian frozen food industry. |

**Keywords:** Supply chain, procurement process, supplier evaluation, frozen food industry

## INTRODUCTION

The frozen food industry plays a crucial role in modern food supply chains, transforming perishable agricultural commodities into value-added, shelf-stable, and consumer-ready products (Mazz *et al.,* 2022; Sajankar *et al.,* 2025). This sector has experienced rapid growth in recent years, driven by changing consumer lifestyles, a preference for convenience, and increased focus on food safety and quality (Funde & Shrivastava, 2023; Arora *et al.,* 2022). India, with its abundant agricultural base and growing middle class, holds significant potential in frozen food manufacturing and exports (Calapre & Paspasan, 2024; Kaur *et al.,* 2024).

Procurement in this industry is a vital function that ensures the availability of raw materials and packaging components, directly impacting product quality, operational efficiency, and regulatory compliance. Due to the perishable nature of inputs and stringent food safety norms, food firms must adopt structured, transparent, and quality-oriented procurement practices (Dua & Sahu, 2024; Luzzini & Ronchi, 2011). Effective procurement depends on selecting reliable suppliers who consistently deliver safe, compliant, and cost-effective materials. Therefore, supplier evaluation is a critical step in managing risk and maintaining a resilient supply chain (Asamoah *et al.,* 2016; Saad *et al.,* 2016; Prahinski & Benton, 2004).

While several global studies have explored procurement models and vendor evaluation frameworks (Kamath & Naik, 2018; Kaur & Singh, 2019), there is limited empirical research focused on frozen food manufacturing in the Indian context (Lou *et al.,* 2024; Chauhan *et al.,* 2025). Moreover, practical documentation of how procurement is carried out for both existing and new suppliers remains underexplored.

This study addresses this gap by examining the procurement workflow and supplier evaluation practices in Gujarat’s frozen food manufacturing sector. It also identifies key criteria considered during supplier selection, using the Henry Garrett Ranking method to prioritize responses from industry professionals.

The specific objectives of the study are:

## To study the process of raw material purchasing in frozen food manufacturing firms

## To determine the important criteria used to evaluate suppliers in food processing firms

## 2. RESEARCH METHODOLOGY

This study was conducted to explore procurement practices and supplier evaluation criteria among frozen food processing firms in Gujarat. A multi-stage purposive sampling technique was employed. Initially, food manufacturing firms operating in the frozen food sector across major districts of Gujarat were identified. From this pool, 20 firms were selected based on their scale of operations (medium to large), active procurement departments, and willingness to participate. Respondents included purchase managers or procurement heads from each selected firm.

The first objective, studying the raw material procurement process was addressed using a case study and observational approach within one leading frozen food firm. The researcher reviewed documentation, procurement workflows, and conducted informal interviews with procurement and quality assurance teams. To achieve the second objective, identifying important supplier evaluation criteria data were collected through a structured questionnaire administered to the 20 participating firms. Respondents were asked to rank a set of predefined supplier evaluation criteria (such as quality, price, delivery accuracy, etc.) based on their practical importance in decision-making.

The Henry Garrett Ranking Technique was selected for its ease of use and interpretability in industrial studies where expert judgment is crucial. Though considered traditional, this method remains widely adopted in supply chain, agribusiness, and procurement research due to its ability to convert qualitative rankings into statistically analyzable scores. This method converts ranks into scores based on percentage positions, allowing the calculation of mean scores across all respondents to determine the relative importance of each criterion. The formula used to calculate the percentage position is:

Percentage position = 100 (𝑅𝑖𝑗 - 0.5) / 𝑁𝑗

Where,

Rij = Rank given for the ith variable by jth respondent

Nj = Number of variables ranked by jth respondent

These percentage positions were then converted into Garrett scores using a standard table. The mean scores for each criterion were calculated to determine their final ranking.

## 4. RESULTS AND DISCUSSION

**4.1 To study the process of raw material purchasing in frozen food manufacturing firm**

**4.1.1 Key activity of the purchase department**

1. Initiation of Purchase for Raw and Packaging Materials: In the dynamic world of frozen food manufacturing, efficient procurement is essential for meeting production and quality demands. This process is closely linked to demand forecasting, customer orders, and production planning—forming a critical chain that ensures a smooth and profitable operation.
2. Production Planning: The production manager prepares a weekly production plan, which is shared with the purchase department to estimate raw material requirements based on defined recipes.
3. Material Requirement Estimation: Using standardized product recipes, the total quantity of ingredients required is calculated.
4. Change Communication: Any changes in the production plan are promptly communicated to the purchase department for real-time adjustment of procurement.
5. Procurement Timing Based on Shelf Life

* Dry and non-perishable items (e.g., spices, oils): Procured one week in advance.
* Perishable items (e.g., fruits, vegetables): Procured one day prior to production.

**4.1.2 Procurement process of past purchase raw material**

There are distinct procurement procedures for raw materials based on whether the item has been previously used or is being procured for the first time. Previously purchased raw materials refer to ingredients that have already been included in past formulations and recipes. For such items, a list of approved vendors is usually available, eliminating the need for supplier discovery, sample approval, or new vendor onboarding.

The procurement process begins when a demand is raised by the production unit (kitchen), followed by the following steps:

**1. Demand from kitchen and prepare specification of product**

The procurement process begins with the purchasing unit identifying the need, followed by an internal review of the technical and financial requirements.

Items, equipment, materials, and components required at the manufacturing site are recognized and a requisition is prepared for the same.

This requisition is then sent to the store department for further verification on the availability of them in the store. This requisition is a formal document with a specific document number and is called

Material Requisition or Material Indent. The store department checks the availability of this material. In case the material is available in the store, the same is issued with an issue note.

However, if the said material is not available in the store, then another requisition needs to be raised. This requisition is called a Purchase Requisition. The same is raised by the store department

and is sent to the purchase department for further action. The specification aims to increase food safety and ensure the frozen food products quality high. Product specification is usually **Fig. 1 Procurement process for past purchase (existing suppliers)**

created by the Purchasing Department, together with the Quality Assurance (QA) Team in a frozen food company. The purchasing Team decides what to buy and from whom and the quality Team makes sure the products are safe, high quality, and meet food laws.

**2. Get quotation, supplier selection, negotiation and performa invoice**

The company solicits quotations from pre-approved suppliers. Quotations are evaluated based on price, product quality, and supplier reliability. After selection, commercial terms such as pricing, delivery schedule, and payment terms are negotiated. A Proforma Invoice is then obtained from the selected supplier, summarizing the agreed-upon terms before issuing the final purchase order.

Quotation → helps in choosing the best supplier → then negotiate terms → finalized with a proforma invoice before the actual purchase.

**3. Purchase order, expedite order and follow up**

A formal document sent to the supplier confirming the order details (product, quantity, price, delivery date) is called a purchase order. The buyer checks in with the supplier to ensure the order is being processed and will be delivered on time. Continuous communication is maintained until the goods are received, checking for delays or issues.

The purchase order confirms the deal → the buyer expedites the order to track progress → regular follow-up ensures on-time and correct delivery.

**4. Receiving and Inspection**

The quality team checks the received materials for defects, quantity, and compliance with specifications. Then, a receipt note is prepared by the stores/warehouse team to confirm the receipt of materials as per the purchase order and physical verification. Gate entry is where details of incoming materials (vehicle number, supplier name, invoice details) are recorded at the security gate.

**5. Submit PI, PO with Receiving Notes in Account Department & Payment of Invoice to supplier**

After materials are received and inspected, the PI, PO and Receiving Notes are submitted to the Accounts Department for verification. Once matched and approved, the Invoice Payment is processed to the supplier.

**6. Maintain records and maintain vendors**

Maintaining records is a process of systematically storing and organizing all transaction-related documents, such as purchase orders, invoices, and receiving notes, for future reference and auditing.

Maintaining Vendors involves managing and updating vendor information, including contact details, payment terms, and performance records, to ensure smooth and efficient procurement operations.

**4.1.3 Procurement process for first time buy raw material**

This process is time-consuming and involves coordination with the New Product Development (NPD) Department. The Purchase Department reaches out to multiple suppliers, collects samples from them and gives them to NPD for approval.

Potential sources for the raw material are then explored, and samples are obtained for NPD evaluation. These samples undergo further QC testing to verify compliance with specifications. Upon approval, a raw material risk assessment is conducted to evaluate quality, safety, and regulatory concerns.

Suitable suppliers are identified and asked to fill out a Supplier Information Form, after which they undergo an audit or submit a self-assessment to validate their compliance and capabilities.

If found satisfactory, the specifications are finalized and trial samples are ordered. These trial samples undergo another QC check, and if cleared, are used in commercial trial production by the NPD team. Successful batch trials lead to supplier evaluation and final selection, after which the supplier is approved and added to the vendor list.

A proforma invoice is then collected, and a purchase order (PO) is issued. Upon receipt of the material, payment is processed, and the supplier is continuously evaluated as per the scheduled audit plan to ensure ongoing compliance and performance. This interlinked process ensures quality, traceability, and reliability of new raw materials before full-scale procurement.

**4.1.4 Establish contract with raw material supplier**

The company establishes a structured and reliable yearly contract for raw materials that experience frequent price fluctuations, to ensure cost stability and secure uninterrupted supply. This type of contract ensures consistent supply, cost efficiency, and quality compliance, while minimizing procurement risks and enhancing supplier collaboration.



**Fig. 2 Procurement process for first-time raw material**

**Steps to establish contract with raw material supplier**

1. Identify Key Raw Materials (with price volatility)

2. Forecast Annual Requirement (based on production plan)

3. Review Approved Vendor List (AVL)

4. Request Quotations from Qualified Suppliers

5. Evaluate and Negotiate Commercial Terms

→ Price, MOQ, Delivery Terms, Credit Period

6. Define Quality Specs and Sampling Procedures

7. Draft Annual Contract (including all terms)

8. Internal Review & Approval (Purchase, QC, Finance)

9. Sign Contract with Supplier

10. Share Tentative Delivery Schedule / Forecast

11. Monitor Supplier Performance (Monthly/Quarterly)

12. Mid-Year Review (adjust terms if needed)

13. Year-End Evaluation and Renewal Decision

**4.1.5 Inventory Forecast for Raw Material in a Frozen Food Firm**

**1. Analyze Sales Forecast & Production Plan**

Estimate finished goods demand based on historical sales, seasonal trends, and marketing plans.

Convert this into raw material requirements using Bill of Materials (BOM) for each product.

**2. Classify Raw Materials**

Group items into categories:

High usage (A) – e.g., vegetables, dairy ingredients

Moderate usage (B) – spices, flavours

Low usage (C) – specialty or imported ingredients

**3. Calculate Lead Time & Safety Stock**

Determine average supplier lead time for each raw material

Calculate safety stock to avoid shortages due to delays or demand fluctuations.

**4. Apply Inventory Forecasting Methods**

Choose the best-fit method:

Time Series Analysis – Based on past consumption trends.

Moving Average or Exponential Smoothing – For stable demand items.

Demand-Driven Forecasting – For promotional/seasonal products.

**5. Monthly/Quarterly Consumption Planning**

Forecast monthly or quarterly raw material needs.

Adjust for promotions, holidays, and seasonal spikes (e.g., summer demand for frozen fruits).

**6. Generate Procurement Plan**

Align forecast with procurement cycles.

Plan bulk buying for high-usage items to optimize cost and logistics.

**7. Monitor & Update Forecast Regularly**

Compare forecasted vs. actual consumption.

Adjust forecasts monthly based on deviations and changes in market demand.

**4.2 TO DETERMINE THE IMPORTANT CRITERIA TO EVALUATE SUPPLIERS IN FOOD PROCESSING FIRMS**

Supplier evaluation plays a critical role in ensuring quality and consistency in the food processing industry. Based on literature, industry consultations, and internal procurement documentation, 22 evaluation criteria were shortlisted for this study. These factors reflect commonly used metrics in vendor assessment within the food manufacturing sector and were chosen for their relevance to quality assurance, cost efficiency, reliability, and compliance. Procurement heads from 20 frozen food firms ranked these criteria according to their importance in real-world supplier selection. The rankings were analyzed using the Henry Garrett Ranking Method, allowing calculation of mean scores and prioritization of each factor.

The results presented in Table 1 indicate that quality of product is the most significant criterion in supplier evaluation within food processing firms, with a Garrett mean score of 78.40, earning it the top rank. This is followed by price, which secured the second rank with a mean score of 75.00, and accuracy of delivery, ranked third with a mean score of 70.36. Other notable factors include rejection and repair service, production facility and capability, and performance history, which were ranked fourth, fifth, and sixth, respectively.

**Table 1: Criteria for** **the evaluation of suppliers in food processing firms**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Total**  **Score** | **Garrett Ranking Mean** | **Rank** | **Category** |
| Quality of Product | 1650 | 78.40 | I | Extreme Importance |
| Price | 1548 | 75 | II |
| Accuracy of Delivery | 1494 | 70.36 | III |
| Rejection & Repair Service | 1725 | 67.90 | IV |
| Production Facility & Capability | 1395 | 63.40 | V |
| Warranties & Claim Polices | 1362 | 61.90 | VI | Considerable Importance |
| Performance History | 1287 | 58.5 | VII |
| Communication System | 1248 | 56.72 | VIII |
| Technical Capability | 1206 | 54.81 | IX |
| Financial Positions | 1113 | 50.59 | X |
| Procedural Compliance | 1050 | 47.72 | XI | Average Importance |
| Reputation and Position in the Industry | 1029 | 46.77 | XII |
| Desire for Business | 1005 | 45.68 | XIII |
| Management and Organization | 942 | 42.81 | XIV |
| Operation Controls | 774 | 35.18 | XV |
| Attitude | 774 | 35.18 | XVI | Slight Importance |
| Impression | 765 | 34.77 | XVII |
| Packing Ability | 720 | 32.72 | XVIII |
| Labor Relation Record | 654 | 29.72 | XIX |
| Geographical location | 591 | 26.86 | XX |
| Amount of Past Business | 483 | 21.95 | XXI |
| Training Aids | 396 | 18.00 | XXII |

**Table 2: Criteria used most often for supplier evaluation**

|  |  |
| --- | --- |
| **Criterion** | **Key terms used for measurement** |
| Quality | Quality consistency, proactive quality management |
| Price | Price competitiveness, Price stability |
| Accuracy of Delivery | On-time delivery, Delivery flexibility |
| Rejection & Repair Service | Rejection rate handling, Complaint resolution time |
| Production Facility & Capability | Capacity adequacy, scalability & expansion potential |

Quality is assessed based on the consistency of the goods or services delivered and the supplier’s proactive approach to quality management. This reflects a preference for preventing issues through continuous monitoring and compliance, rather than merely reacting to problems.

Price is evaluated not only in terms of market competitiveness but also in terms of long-term price stability. This highlights the importance of predictable and reliable pricing for effective budget planning and procurement efficiency.

Accuracy of Delivery includes both on-time delivery performance and flexibility in adjusting delivery schedules. This criterion emphasizes the supplier’s ability to respond to changing operational needs and maintain continuity in supply.

Rejection and Repair Service is measured by the rate at which defective goods are handled and the speed of complaint resolution. A supplier’s responsiveness in these areas indicates their commitment to post-purchase service and customer satisfaction.

Finally, Production Facility and Capability refers to the supplier’s installed production capacity, readiness to meet demand, and scalability for future growth. It reflects the firm’s ability to maintain supply even during high-demand periods or when product expansion is required.

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**Fig. 3 Data collection**

## 4. CONCLUSION

The study reveals that frozen food manufacturing firms in Gujarat follow a well-structured, quality-driven procurement system that prioritizes operational efficiency, compliance with food safety norms, and supplier accountability. Observations from a leading firm demonstrated detailed workflows for both routine and first-time raw material purchases, involving collaboration between procurement, quality assurance (QA), and new product development (NPD) teams. Analysis of data from 20 firms using the Henry Garrett Ranking method highlighted that product quality was the most important supplier evaluation criterion, with a mean score of 78.40, followed by price (75.00) and accuracy of delivery (70.36). Other factors such as rejection handling, production capability, and performance history were also identified as relevant but secondary considerations. These findings reflect the critical need for reliable, safe, and cost-effective procurement in the highly sensitive frozen food sector. The insights from this study offer a valuable framework for procurement officers, supply chain managers, and policymakers aiming to strengthen vendor evaluation systems, enhance sourcing efficiency, and ensure continuous quality assurance in the Indian food processing industry. The supplier ranking model and mapped procurement procedures may also serve as a benchmark for other agro-processing units seeking to professionalize their sourcing functions.

**5. SCOPE OF FUTURE RESEARCH**

Future research can be extended across multiple strategic areas to further strengthen procurement systems in the frozen food industry:

1. **Technological Advancements**

Investigate how emerging technologies such as blockchain, artificial intelligence (AI), and the Internet of Things (IoT) can enhance traceability, automate quality control, and improve transparency across procurement and supply chains.

1. **Sustainable and Ethical Procurement**

Explore the integration of sustainability criteria into supplier selection focusing on environmental impact, ethical sourcing, and corporate social responsibility (CSR) in line with global food industry trends.

1. **Risk Mitigation and Supply Chain Resilience**

Analyze strategies to reduce vulnerabilities in the raw material supply chain related to climate change, geopolitical disruptions, and pandemics, which may affect sourcing and lead times.

1. **Supplier Collaboration and Innovation**

Examine how long-term partnerships and collaborative frameworks with suppliers contribute to improved product quality, delivery reliability, and innovation in ingredient sourcing and logistics.

1. **Consumer-Driven Procurement**

Study the influence of evolving consumer preferences such as growing demand for organic, non-GMO, or locally sourced ingredients on supplier selection and procurement decision-making.

1. **Building Resilient Procurement Systems**

Develop frameworks that help frozen food companies withstand disruptions while maintaining consistent raw material flow through agile procurement practices and data-driven forecasting.

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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## REFERENCES

Asamoah, D., Annan, J., & Nyarko, S. (2016). AHP approach for supplier evaluation and selection in a pharmaceutical manufacturing firm in Ghana. *International Journal of Business and Management.* 7(10), 49-62.

Banerjee, S. (2021). A comprehensive review on the economic status of the global convenience food industry. *International Journal of Business, Management & Economics*, 2(1), 43-52.

Calapre, G. O., &Paspasan, R. M. (2024). Procurement process optimization: A quantitative assessment of alternative procurement strategies. *International Journal of Research and Innovation in Social Science*, *8*(11), 1326-1340.

Chauhan, P., Kumar, R., Arora, M., & Sarfraz, M. (2025). Consumer adoption of frozen food products in Uttarakhand, India during COVID-19 pandemic. *International Journal of Business Performance Management*, 26(5) 598-614.

Dua, A., & Sahu, S. (2024). Factor identification for the procurement of raw material in food processing industry. *Journal of Innovation and Management*, 2(2), 1-13.

Funde, Y., & Shrivastava, A. (2023). Exploring Factors Driving the Choice of Frozen Food in the Indian Market. *Journal of Indian Management*, 20(3), 57-69.

Kamath, G., & Naik, R. (2018). A vendors evaluation using AHP for an Indian steel pipe manufacturing company*. International Journal of the Analytic Hierarchy Process.* 8(3), 442- 461.

Kamath, G., Barkur, G., & Naik, R. *(2018*). Does supplier evaluation impact process improvement? *Journal of Industrial Engineering and Management,* 9(3), 708-731.

Kaur, H., & Singh, S. P. (2019). Flexible dynamic sustainable procurement model. *Annals of Operations Research*, 273(1), 651-691.

Kaur, S., Aggarwal, P., & Kaur, N. (2024). Evolution of Indian Frozen French Fry Industry: Industrial Constraints, Challenges and Future Prospects. *Potato Research*, 67(4), 1287-1306.

Lou, S., You, X., & Xu, T. (2024). Sustainable supplier evaluation: From current criteria to 7reconstruction based on ESG requirements. Sustainability, 16(2), 757-780.

Luzzini, D., & Ronchi, S. (2011). Organizing the purchasing department for innovation. *Operations Management Research*, 4(1), 14-27.

Maaz, M. A. M., Ahmad, R., & Abad, A. (2022). Antecedents and consequences of green supply chain management practices: a study of Indian food processing industry. *Benchmarking: An International Journal*, 29(7), 2045-2073.

Manikandan, R., & Vidhya, N. (2023). Application of Henry Garrett ranking technique to elect the preference of influencing factors of coir industrial growth. *International Journal of Environmental Economics, Commerce and Educational Management*, 10(7), 46-52.

Prahinski, C., & Benton, W. C. (2004). Supplier evaluations: communication strategies to improve supplier performance. *Journal of operations management*, 22(1), 39-62.

Rathore, J., Sharma, A., & Saxena, K. (2010). Cold Chain Infrastructure for Frozen Food: A Weak Link in Indian Retail Sector. *IUP journal of supply chain management*, 7.

Saad, S. M., Kunhu, N., & Mohamed, A. M. (2016). A fuzzy-AHP multi-criteria decision-making model for procurement process. *International journal of logistics systems and management*, 23(1), 1-24.

Sajankar, T. S., Ukey, P. D., Jadhav, M. M., Gaikwad, P. B., & Kadu, S. B. (2025). Challenges and Technological Constraints in India’s Food Supply Chain Management: A Sustainability Perspective. *International Journal of Global Business and Competitiveness*, 1-14.